

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

OYSTER OPTICS, LLC,

Plaintiff,

v.

CISCO SYSTEMS, INC. and  
BRITISH TELECOMMUNICATIONS  
PLC,

Defendants.

Civil Action No. \_\_\_\_

**JURY TRIAL DEMANDED**

**COMPLAINT FOR PATENT INFRINGEMENT**

This is an action for patent infringement arising under the Patent Laws of the United States of America, 35 U.S.C. § 1 *et seq.* in which Plaintiff Oyster Optics, LLC (“Oyster” or “Plaintiff”) makes the following allegations against Defendants Cisco Systems, Inc. (“Cisco”) and British Telecommunications PLC (“BT”) (collectively, “Defendants”).

**PARTIES**

1. Oyster Optics, LLC is a Texas company, and has a place of business at 11921 Freedom Drive, Suite 550, Reston, VA 20190.

2. On information and belief, Cisco is a California corporation with its principal place of business at 170 West Tasman Drive, San Jose, California 95134. Cisco can be served through its registered agent, Prentice Hall Corporation System, 211 E. 7<sup>th</sup> Street, Suite 620, Austin, TX 78701.

3. On information and belief, BT is an English corporation with its principal place of business at BT Group PLC, BT Centre, 81 Newgate Street, London EC1A 7AJ. BT can be

served through its registered agent, CT Corporation System, 350 N. St. Paul Street, Dallas, TX 75201.

4. On information and belief, Cisco and BT formed a partnership to develop 100G optical networking equipment, including the 100G Accused Instrumentalities described herein.

**JURISDICTION AND VENUE**

5. This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

6. This Court has personal jurisdiction over Cisco in this action because, among other reasons, Cisco has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with the forum state of Texas. Cisco maintains several places of business within the State, including at 2250 East President George Bush Turnpike, Richardson, TX 75082. Cisco directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, making, using, importing, offering for sale, and/or selling products and/or services that infringe the patents-in-suit. Thus, Cisco purposefully availed itself of the benefits of doing business in the State of Texas and the exercise of jurisdiction over Cisco would not offend traditional notions of fair play and substantial justice. Cisco is registered to do business in the State of Texas, and has appointed Prentice Hall Corporation System, 211 E. 7<sup>th</sup> Street, Suite 620, Austin, TX 78701 as its agent for service of process.

7. This Court has personal jurisdiction over BT in this action because, among other reasons, BT has committed acts within the Eastern District of Texas giving rise to this action and

has established minimum contacts with the forum state of Texas. BT maintains several places of business within the State, including at 2250 East President George Bush Turnpike, Richardson, TX 75082. BT directly and/or through subsidiaries or intermediaries (including distributors, retailers, and others), has committed and continues to commit acts of infringement in this District by, among other things, making, using, importing, offering for sale, and/or selling products and/or services that infringe the patents-in-suit. Thus, BT purposefully availed itself of the benefits of doing business in the State of Texas and the exercise of jurisdiction over BT would not offend traditional notions of fair play and substantial justice. BT is registered to do business in the State of Texas, and has appointed CT Corporation System, 350 N. St. Paul Street, Dallas, TX 75201 as its agent for service of process.

8.       Venue is proper in this District under 28 U.S.C. §§ 1391 (b)-(c) and 1400(b) because Defendants are subject to personal jurisdiction in this District, have transacted business in this District, and have committed acts of patent infringement in this District.

#### **BACKGROUND**

9.       In the early 2000s, Oyster Optics, Inc., a research, development, and engineering company, was focused upon innovation in government, commercial, security, and broad-band applications of leading edge fiber optics technology. Mr. Peter (“Rocky”) Snawerdt was at Oyster Optics, Inc. when he invented the subject matter of U.S. Patent Nos. 6,469,816; 6,476,952; 6,594,055; 7,099,592; 7,620,327; 8,374,511; and 8,913,898 (collectively, “asserted patents” or “patents-in-suit”).

10.      Oyster is the owner by assignment of United States Patent No. 6,469,816 (“the ’816 Patent”) entitled “Phase-Modulated Fiber Optic Telecommunications System.” The ’816

Patent was duly and legally issued by the United States Patent and Trademark Office on October 22, 2002. A true and correct copy of the '952 Patent is included as Exhibit A.

11. Oyster is the owner by assignment of United States Patent No. 6,476,952 ("the '952 Patent") entitled "Phase-Modulated Fiber Optic Telecommunications System." The '952 Patent was duly and legally issued by the United States Patent and Trademark Office on November 5, 2002. A true and correct copy of the '952 Patent is included as Exhibit B.

12. Oyster is the owner by assignment of United States Patent No. 6,594,055 ("the '055 Patent") entitled "Secure Fiber Optic Telecommunications System and Method." The '055 Patent was duly and legally issued by the United States Patent and Trademark Office on July 15, 2003. A true and correct copy of the '055 Patent is included as Exhibit C.

13. Oyster is the owner by assignment of United States Patent No. 7,099,592 ("the '592 Patent") entitled "Telecommunications Card for Secure Optical Data Transmission and Installation Method." The '592 Patent was duly and legally issued by the United States Patent and Trademark Office on August 29, 2006. A true and correct copy of the '592 Patent is included as Exhibit D.

14. Oyster is the owner by assignment of United States Patent No. 7,620,327 ("the '327 Patent") entitled "Fiber Optic Telecommunications Card with Energy Level Monitoring." The '327 Patent was duly and legally issued by the United States Patent and Trademark Office on November 17, 2009. A true and correct copy of the '327 Patent is included as Exhibit E.

15. Oyster is the owner by assignment of United States Patent No. 8,374,511 ("the '511 Patent") entitled "Fiber Optic Telecommunications Card with Energy Level Monitoring." The '511 Patent was duly and legally issued by the United States Patent and Trademark Office on February 12, 2013. A true and correct copy of the '511 Patent is included as Exhibit F.

16. Oyster is the owner by assignment of United States Patent No. 8,913,898 (“the ’898 Patent”) entitled “Fiber Optic Telecommunications Card with Energy Level Monitoring.” The ’898 Patent was duly and legally issued by the United States Patent and Trademark Office on December 16, 2014. A true and correct copy of the ’898 Patent is included as Exhibit G.

**COUNT I**

**INFRINGEMENT OF THE '816 PATENT**

**(against Cisco)**

17. Oyster references and incorporates by reference paragraphs 1 through 16 of this Complaint.

18. On information and belief, Cisco makes, uses, offers to sell and/or sells in the United States products that infringe various claims of the ’816 Patent, and continues to do so. These include without limitation the CRS-1 1-Port OC-768C/STM-256C Tunable WDMPOS Interface Module (“CRS-1 1-Port Interface Module”) and the ONS 15454 Multiservice Transport Platform (collectively, “40G Accused Instrumentalities”).

19. On information and belief, the 40G Accused Instrumentalities are a fiber optic data transmission system. For example, the exemplary CRS-1 1-Port OC-768C/STM-256C Tunable WDMPOS Interface Module (“CRS-1 1-Port Interface Module”) uses the Packet over SONET/SDH (POS) protocol, which is used for transmission of data over an optical fiber.

20. On information and belief, the 40G Accused Instrumentalities comprise a transmitter having a laser emitting a continuous wave light. For example, the CRS-1 1-Port Interface Module contains a full C-band tunable laser. The 40G Accused Instrumentalities utilize Differential Phase Shift Key (DPSK) technology, which establishes that the 40G Accused Instrumentalities phase modulate the continuous wave light.

21. On information and belief, the 40G Accused Instrumentalities comprise a telecommunications optical fiber connected to at least one receiver, the phase-modulator being connected to the telecommunications fiber so that the phase-modulated information optical signal is transmitted over the telecommunications fiber without recombining with the continuous wave light. For example, the exemplary CRS-1 1-Port Interface Module uses the Packet over SONET/SDH (POS) protocol, which is used for transmission of data over an optical fiber.

22. On information and belief, Cisco has directly infringed and continues to directly infringe the '816 Patent by, among other things, making, using, offering for sale, and/or selling the '816 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '816 Patent including at least claim 1. Cisco also sold and offered for sale the ONS 15454 Multiservice Transport Platform product, which also infringe in a substantially similar manner.

23. By making, using, offering for sale, and/or selling the 40G Accused Instrumentalities infringing the '816 Patent, Cisco has injured Oyster and is liable to Oyster for infringement of the '816 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

24. In addition, Cisco actively induces others, including without limitation customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 1 of the '816 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Cisco's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '816 Patent. Cisco has actual knowledge of the '816 Patent at least as of service of this Complaint. Cisco is

knowingly inducing its customers and/or end users to directly infringe the '816 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Cisco's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '816 Patent.

25. In addition, Cisco offers to sell or sells within the United States, or imports into the United States, a component of a machine, manufacture, combination or composition patented in the '816 Patent, knowing the same to be especially made or adapted for use in an infringement of the '816 Patent and not a staple article or commodity of commerce suitable for substantial noninfringing use, in violation of 35 U.S.C. § 271(c). Cisco has actual knowledge of the '816 Patent at least as of service of this Complaint, and specific intent that its customers and end users of 40G Accused Instrumentalities use its components to directly infringe each and every claim limitation, including without limitation claim 1 of the '816 Patent.

26. To the extent facts learned in discovery show that Cisco's infringement of the '816 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

27. As a result of Cisco's infringement of the '816 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Cisco's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cisco, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Cisco's infringing activities are enjoined by this Court.

28. Unless a permanent injunction is issued enjoining Cisco and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '816 Patent, Oyster will be greatly and irreparably harmed.

**COUNT II**

**INFRINGEMENT OF THE '952 PATENT**

**(against Cisco)**

29. Oyster references and incorporates by reference paragraphs 1 through 28 of this Complaint.

30. Cisco makes, uses, offers to sell and/or sells in the United States products that infringe various claims of the '952 Patent, and continues to do so. These include without limitation the CRS-1 1-Port OC-768C/STM-256C Tunable WDMPOS Interface Module ("CRS-1 1-Port Interface Module") and the ONS 15454 Multiservice Transport Platform (collectively, "40G Accused Instrumentalities").

31. The 40G Accused Instrumentalities are a fiber optic data transmission system. For example, the exemplary CRS-1 1-Port OC-768C/STM-256C Tunable WDMPOS Interface Module ("CRS-1 1-Port Interface Module") uses the Packet over SONET/SDH (POS) protocol, which is used for transmission of data over an optical fiber.

32. The 40G Accused Instrumentalities comprise an optical data transmitter comprising a laser for producing light, a phase modulator phase modulating the light, and an electronic control circuit for receiving an electronic input data stream and controlling the phase-modulator, the electronic control circuit including an input data circuit having an electronic delay. The 40G Accused Instrumentalities comprise a laser, for example, the CRS-1 1-Port Interface Module contains a full C-band tunable laser. The 40G Accused Instrumentalities

utilize Differential Phase Shift Key (DPSK) technology, which establishes that the 40G Accused Instrumentalities phase modulate the continuous wave light. The 40G Accused Instrumentalities use a DPSK transmitter for communications. On information and belief, the transmitter feedback loop in a precoder with a time delay “T” element feeding into an exclusive-or gate along with an input data stream and producing an output that controls the phase modulator.

33. On information and belief, the 40G Accused Instrumentalities comprise a phase compensation circuit for altering an output of the input data circuit, the phase compensation circuit including an N-bit register for storing a desired phase compensation amount, an ALU for summing without carry the desired phase compensation amount, and a delayed feedback exclusive-or gate having a gate output and receiving the input data stream as an input. For example, a DPSK transmitter, which on information and belief is consistent with the design of the 40G Accused Instrumentalities, includes an exclusive-or gate receiving the input data stream as input and producing an output. On information and belief, a most significant bit of an ALU output of the ALU is fed together with the gate output through another exclusive-or gate.

34. On information and belief, Cisco has directly infringed and continues to directly infringe the ’952 Patent by, among other things, making, using, offering for sale, and/or selling the ’952 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the ’952 Patent including at least claim 13. Cisco also sold and offered for sale the ONS 15454 Multiservice Transport Platform product, which also infringe in a substantially similar manner.

35. By making, using, offering for sale, and/or selling the 40G Accused Instrumentalities infringing the ’952 Patent, Cisco has injured Oyster and is liable to Oyster for

infringement of the '952 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

36. In addition, Cisco actively induces others, including without limitation customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 13 of the '952 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Cisco's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 13 of the '952 Patent. Cisco has actual knowledge of the '952 Patent at least as of service of this Complaint. Cisco is knowingly inducing its customers and/or end users to directly infringe the '952 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Cisco's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '952 Patent.

37. As a result of Cisco's infringement of the '952 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Cisco's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cisco, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Cisco's infringing activities are enjoined by this Court.

38. Unless a permanent injunction is issued enjoining Cisco and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '952 Patent, Oyster will be greatly and irreparably harmed.

**COUNT III**

**INFRINGEMENT OF THE '055 PATENT**

**(against Cisco)**

39. Oyster references and incorporates by reference paragraphs 1 through 38 of this Complaint.

40. Cisco makes, uses, offers to sell and/or sells in the United States 40G Accused Instrumentalities that infringe various claims of the '055 Patent, and continues to do so.

41. The 40G Accused Instrumentalities comprise an optical data transmitter. For example, the CRS-1 1-Port Interface Module uses the Packet over SONET/SDH (POS) protocol, which is used for transmission of data over an optical fiber.

42. The 40G Accused Instrumentalities comprise a transmitter having a light source producing light. The 40G Accused Instrumentalities comprise a laser, for example, the CRS-1 1-Port Interface Module contains a full C-band tunable laser.

43. The 40G Accused Instrumentalities comprise a phase modulator for phase modulating the light source. For example, the 40G Accused Instrumentalities utilize Differential Phase Shift Key (DPSK) technology, which establishes that the 40G Accused Instrumentalities phase modulate the continuous wave light.

44. On information and belief, the 40G Accused Instrumentalities comprise a controller for controlling the phase modulator, including a delayed-feedback exclusive-or gate. For example, on information belief, the 40G Accused Instrumentalities use a DPSK transmitter for communications. On information and belief, the transmitter feedback loop in a precoder with a time delay "T" element feeding into an exclusive-or gate along with an input data stream and producing an output that controls the phase modulator.

45. On information and belief, the controller has a controller output electronic data stream of a plurality of bits, each bit being either a binary zero or a binary one. In a typical DPSK system such as the one used in 40G Accused Instrumentalities, the phase of a signal is always confined to  $-\pi$  or  $\pi$ , where  $\pi = 90^\circ$ , the phase of a signal is confined to 0 or  $\pi$ , where  $\pi = 180^\circ$ , and the  $180^\circ$  offset corresponds to either a binary 0 or 1, or vice versa.

46. On information and belief, the phase modulator in the 40G Accused Instrumentalities creates a phase-modulated optical signal, for each bit the phase modulator imparting on the light for each binary zero of the controller output electronic data stream either a first phase corresponding to the binary zero or a second phase offset 180 degrees from the first phase corresponding to the binary one so as to create the phase-modulated optical signal.

47. On information and belief, the transmitter has an optical output for the phase-modulated optical signal, the phase-modulated optical signal at the optical output being free of amplitude modulation as a function of the input electronic data stream.

48. On information and belief, Cisco has directly infringed and continues to directly infringe the '055 Patent by, among other things, making, using, offering for sale, and/or selling the '055 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '055 Patent including at least claim 15. Cisco also sold and offered for sale the ONS 15454 Multiservice Transport Platform product, which also infringe in a substantially similar manner.

49. By making, using, offering for sale, and/or selling the 40G Accused Instrumentalities infringing the '055 Patent, Cisco has injured Oyster and is liable to Oyster for infringement of the '055 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

50. In addition, Cisco is actively inducing others, such as its customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 15 of the '055 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Cisco's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 15 of the '055 Patent. Cisco has actual knowledge of the '055 Patent at least as of service of this Complaint. Cisco is knowingly inducing its customers and/or end users to directly infringe the '055 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Cisco's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '055 Patent.

51. To the extent facts learned in discovery show that Cisco's infringement of the '055 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

52. As a result of Cisco's infringement of the '055 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Cisco's infringement, but in no event less than a reasonable royalty for the use made of the invention by Cisco, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Cisco's infringing activities are enjoined by this Court.

53. Unless a permanent injunction is issued enjoining Cisco and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '055 Patent, Oyster will be greatly and irreparably harmed.

**COUNT IV**

**INFRINGEMENT OF THE '592 PATENT**

**(against Cisco)**

54. Oyster references and incorporates by reference paragraphs 1 through 53 of this Complaint.

55. Cisco makes, uses, offers to sell and/or sells in the United States 40G Accused Instrumentalities that infringe various claims of the '592 Patent, and continues to do so.

56. The 40G Accused Instrumentalities comprise a card for transmitting data over at least one optical fiber. The exemplary CRS-1 1-Port Interface Module uses the Packet over SONET/SDH (POS) protocol, which is used for transmission of data over an optical fiber.

57. The 40G Accused Instrumentalities comprise a transmitter having at least one light source. For example, the exemplary CRS-1 1-Port Interface Module has a C-band tunable laser.

58. The 40G Accused Instrumentalities comprise a phase modulator for phase modulating light from the source so as to create phase-modulated optical signals in the light. The 40G Accused Instrumentalities utilize Differential Phase Shift Key (DPSK) technology, which establishes that the 40G Accused Instrumentalities phase modulate the continuous wave light.

59. On information and belief, the 40G Accused Instrumentalities create phase-modulated optical signals in the light as a function of an input electronic data stream. For example, on information belief, the 40G Accused Instrumentalities use a DPSK transmitter for communications. On information and belief, the transmitter feedback loop in a precoder with a time delay "T" element feeding into an exclusive-or gate along with an input data stream and producing an output that controls the phase modulator.

60. On information and belief, the 40G Accused Instrumentalities comprise a receiver having an interferometer for reading received optical signals, the interferometer having a delay loop fiber. On information and belief the 40G Accused Instrumentalities utilize a design for a delay line interferometer with two arms of different lengths. For example, Cisco indicated on its Examples of Recent Research Projects web-page that “advanced modulation formats tend to require more complex receivers, such that DPSK demodulation typically requires phases sensitive delay-line interferometers.”

61. On information and belief, the 40G Accused Instrumentalities comprise a fastening device for securing the delay loop fiber. For example, the interferometer device for the 40G Accused Instrumentalities is packaged, on information and belief, in an industry-standard module. Such a module must be fastened and soldered to a circuit board for operation. The subcomponents within the module, including the exemplary delay loop fiber, must be secured to the package or package substrate using a fastening device.

62. On information and belief, Cisco has directly infringed and continues to directly infringe the '592 Patent by, among other things, making, using, offering for sale, and/or selling the '592 40G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '592 Patent including at least claim 1. Cisco also sold and offered for sale the ONS 15454 Multiservice Transport Platform product, which also infringes in a substantially similar manner.

63. By making, using, offering for sale, and/or selling the 40G Accused Instrumentalities infringing the '592 Patent, Cisco has injured Oyster and is liable to Oyster for infringement of the '592 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

64. In addition, Cisco is actively inducing others, such as its customers and end users of 40G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 1 of the '592 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Cisco's customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '592 Patent. Cisco has actual knowledge of the '592 Patent at least as of service of this complaint. Cisco is knowingly inducing its customers and/or end users to directly infringe the '592 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Cisco's inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '592 Patent.

65. To the extent facts learned in discovery show that Cisco's infringement of the '592 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

66. As a result of Cisco's infringement of the '592 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Cisco's infringing activities are enjoined by this Court.

67. Unless a permanent injunction is issued enjoining Cisco and its agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '592 Patent, Oyster will be greatly and irreparably harmed.

**COUNT V**

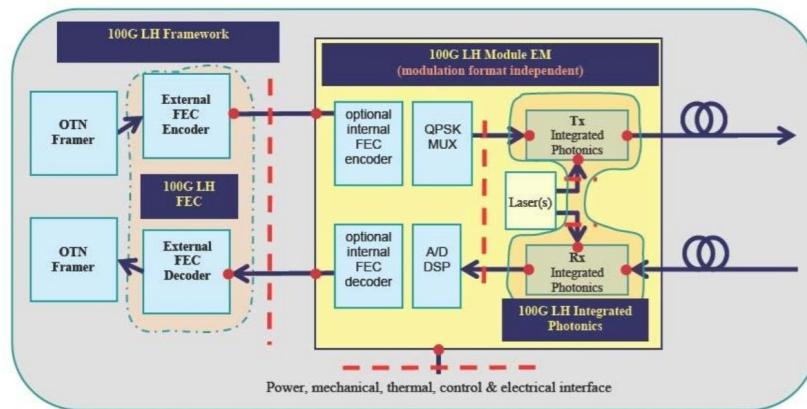
**INFRINGEMENT OF THE '327 PATENT**

**(against all Defendants)**

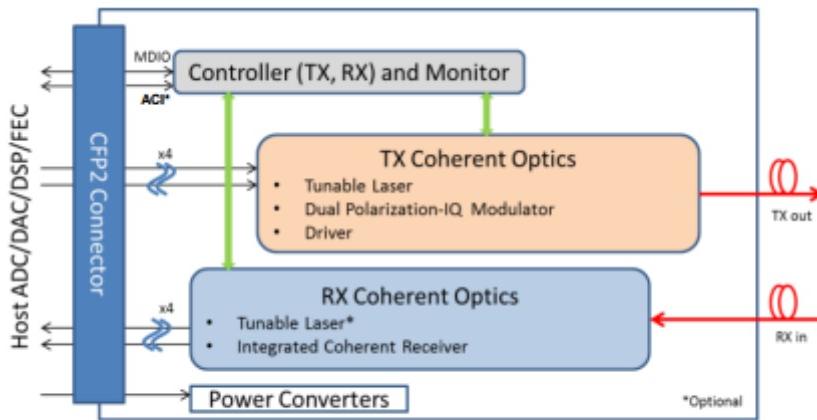
68. Oyster references and incorporates by reference paragraphs 1 through 67 of this Complaint.

69. On information and belief, the exemplary infringing products practice a method for operating an optical fiber multiplexor in a phase modulation mode. These products (“100G Accused Instrumentalities”) include without limitation the exemplary ONS 15454 Multiservice Transport Platform.

70. On information and belief, the 100G Accused Instrumentalities are transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. The 100G Accused Instrumentalities, on information and belief, are designed in accordance with Optical Internetworking Forum (“OIF”) specifications. The implementation of an exemplary OIF standardized DP-QPSK transceiver for sending and receiving data over optical fibers is depicted below. The blocks shown below are printed on a single circuit board or card.

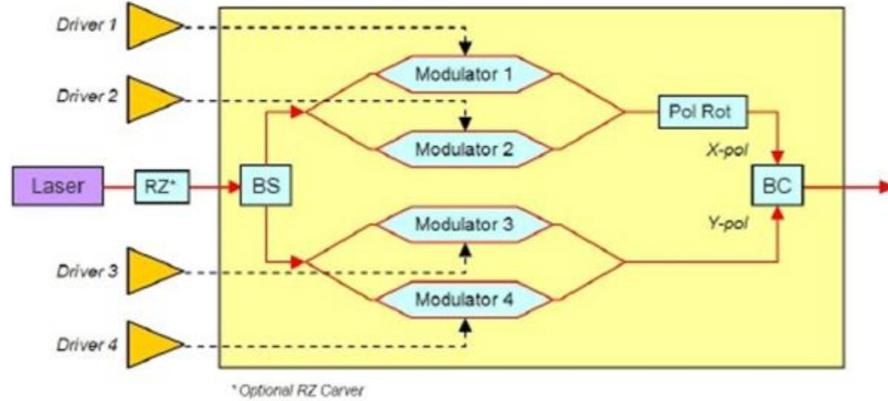


The figure below depicts a product designed in accordance with the OIF CFP2 ACO standard, which shows a module or card that is implemented in a telecommunications box or system.



**Figure 2 CFP2-ACO Module High Level Block Diagram**

71. On information and belief, the 100G Accused Instrumentalities comprise a transmitter for transmitting data over the first optical fiber, the transmitter having a laser, a modulator, and a controller receiving input data and controlling the modulator as a function of the input data, the transmitter transmitting optical signals for telecommunication as a function of the input data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G standard comprise a laser and a modulator. As shown below, OIF 100G Standard devices employ lasers and modulators.



72. As shown below, the Accused Instrumentalities designed in accordance with the OIF CFP2 ACO Standard contain a transmitter (Tx Coherent Optics) with a laser, a modulator, and a driver which is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data.

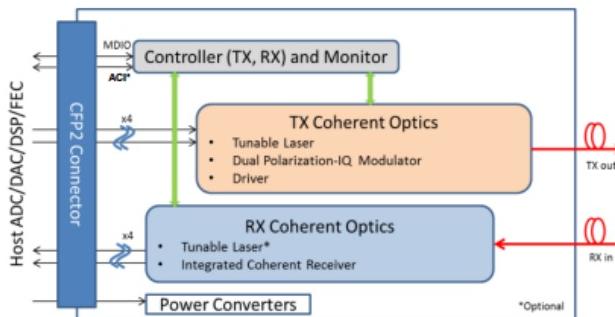
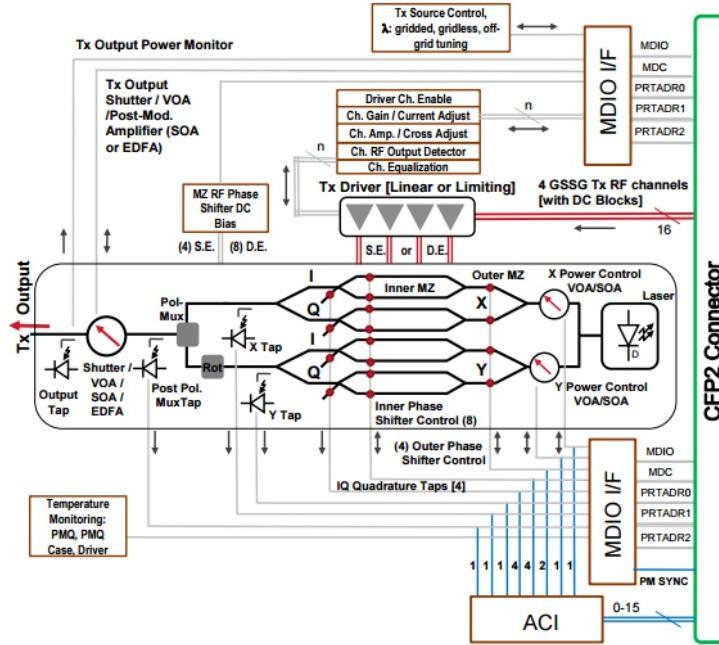


Figure 2 CFP2-ACO Module High Level Block Diagram

73. Figure 10 depicts an exemplary controller consistent with the OIF CPA2 ACO Standard, and, on information and belief, utilized by the 100G Accused Instrumentalities that is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data.



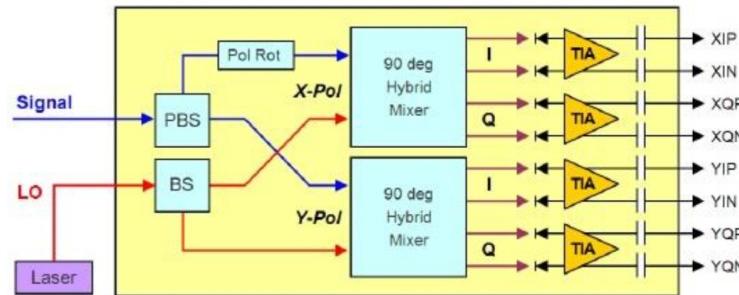
**Figure 4: Superset Transmit Function Block Diagram with an MDIO plus Full Superset Analog Control Interface (ACI)**

74. On information and belief, the 100G Accused Instrumentalities comprise a fiber output optically connected to the laser for connecting the first optical fiber to the card. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilize a laser's optical output as connected through "Tx Integrated Photonics" and an output to reach the optical transmission fiber, as depicted earlier above. A first optical fiber is also depicted as the "Tx out" of the exemplary OIF CFP2 ACO Standardized module.

75. On information and belief, the 100G Accused Instrumentalities comprise a fiber input for connecting the second optical fiber to the card. As depicted earlier above, a fiber receives the data going into the transceiver card.

76. On information and belief, the 100G Accused Instrumentalities comprise a receiver optically connected to the fiber input for receiving data from the second optical fiber. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G

Standard utilize a receiver module, below, that receives the optical signal from the receiver fiber at “Signal.”



77. As shown below, a module designed in accordance with the OIF CPD2 ACO Standard also depicts a receiver.

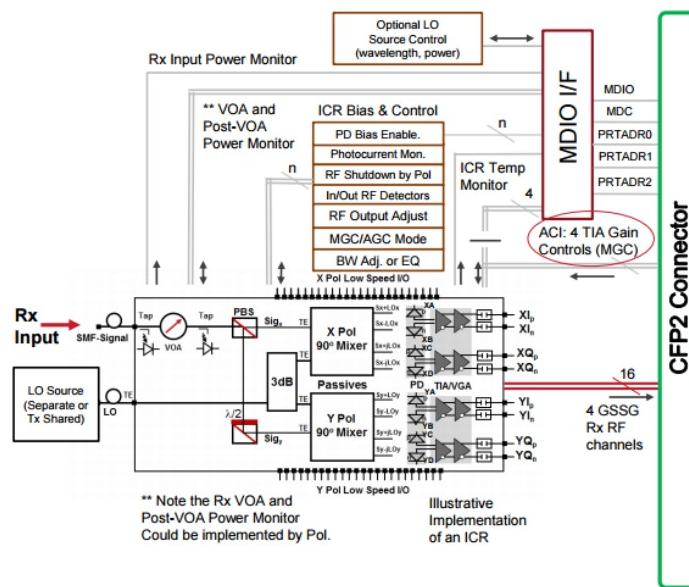
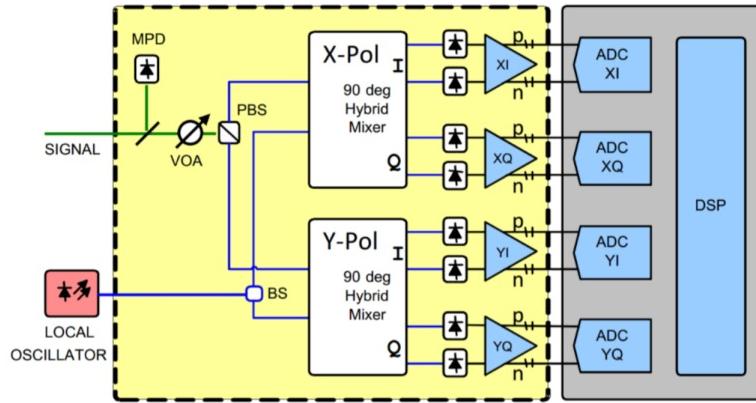


Figure 6: Superset Receive Function Block Diagram with an MDIO plus Full Superset Analog Control Interface (ACI)

78. On information and belief, the 100G Accused Instrumentalities comprise an energy level detector optically connected between the receiver and the fiber input to measure an energy level of the optical signals, wherein the energy level detector includes a plurality of thresholds. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard contain an energy level detector (power tap or monitor photodetector

(“MPD”)), as the OIF 100G Standard specifies an integrated receiver module whose functional diagram is shown below.



One of the basic requirements for the coherent receiver is an optical power tap or monitor photodiode (“MPD”) in the signal input path. This MPD provides a representation of the optical signal strength in the form of an electrical signal. The electrical signal is measured, and provides an indication of the energy level of the optical signal. Table 1 specifies the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values.

**Table 1**

**Table 7: Opto-electrical properties**

Parameter	Units	Min	Typ	Max	Comments
Symbol Rate	Gbaud			32	
Operating Signal Power	dBm	-18	-10	0	Average optical power
Local Oscillator Power	dBm				See Figure 5 for recommended operating conditions.
Linear output swing adjustment range Standard Extended	mVppd mVppd	300 400	500	700 900	Peak to peak, differential, AC coupled

The defined parameters (e.g., current, average, minimum, and maximum) for the receiver input power are as depicted in Table 2 below.

**Table 2**

Rx Total Optical Power Monitoring [13.3 Provides Existing MIS Rx Input Power Monitoring Registers]						
B4E0	1	RO	15-0	Current Input Power [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Total Current Rx Input Power.]	
B4F0 [2.0] [000]	1	RO	15-0	Average Input Power over PM Interval [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Average Total Current Rx Input Power.]	
B500 [2.0] [000]	1	RO	15-0	Minimum Input Power over PM Interval [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Minimum Total Current Rx Input Power.]	
B510 [2.0] [000]	1	RO	15-0	Maximum Input Power over PM Interval [Total Rx Optical]	A signed 16-bit integer with the LSB = 0.01dBm. [2.6 commentary: Preferred Register for CFP2-ACO Maximum Total Current Rx Input Power.]	

Tables 1 and 2 above specify the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values.

79. On information and belief, Defendants have directly infringed and continue to directly infringe the '327 Patent by, among other things, making, using, offering for sale, and/or selling the '327 Accused Instrumentalities, including the ONS 15454 Multiservice Transport Platform. On information and belief, such products and/or services are covered by one or more claims of the '327 Patent, including at least claim 1.

80. By making, using, offering for sale, and/or selling the 100G Accused Instrumentalities infringing the '327 Patent, Defendants have injured Oyster and are liable to Oyster for infringement of the '327 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

81. In addition, Defendants actively induce others, including without limitation customers and end users of 100G Accused Instrumentalities, to directly infringe each and every claim limitation, including without limitation claim 1 of the '327 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendants' customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without

limitation claim 1 of the '327 Patent. Defendants have actual knowledge of the '327 Patent at least as of service of this Complaint. Defendants are knowingly inducing its customers and/or end users to directly infringe the '327 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendants' inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '327 Patent.

82. To the extent facts learned in discovery show that Defendants' infringement of the '327 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

83. As a result of Defendants' infringement of the '327 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

84. Unless a permanent injunction is issued enjoining Defendants and their agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '327 Patent, Oyster will be greatly and irreparably harmed.

**COUNT VI**

**INFRINGEMENT OF THE '511 PATENT**

**(against all Defendants)**

85. Oyster references and incorporates by reference paragraphs 1 through 84 of this Complaint.

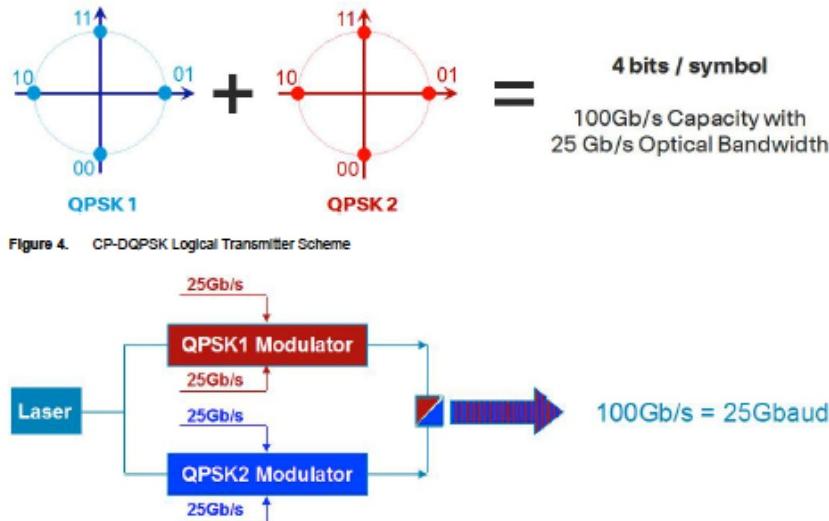
86. On information and belief, Defendants make, use, offer to sell and/or sell in the United States the 100G Accused Instrumentalities that infringe various claims of the '511 Patent, and continue to do so.

87. On information and belief, the 100G Accused Instrumentalities practice a method for operating an optical fiber multiplexor in a phase modulation mode. The '511 Accused Instrumentalities, such as the exemplary ONS 15454 Multiservice Transport Platform, on information and belief, are designed in accordance with the OIF 100G Standard specifying DP-QPSK as the modulation format for 100G. On information and belief, the 100G Accused Instrumentalities are also designed in accordance with the OIF CFP2 ACO Standard.

88. On information and belief, the 100G Accused Instrumentalities perform the step of feeding input data to a controller of a transmitter of a telecommunications box, the telecommunications box having an electronic data input for the input data and an electronic data output. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G standard comprise a laser and a modulator. As shown earlier above, OIF 100G Standard devices employ lasers and modulators. As shown above, OIF 100G Standard devices employ lasers and modulators. The signal passes to the transceiver module. Data is converted to drive signals to control the optical modulators. A transmit laser provides the light source for the modulators. On the receive side the incoming signal is mixed with a local oscillator, demodulated into components, detected, amplified, digitized, then passed into the DSP module.

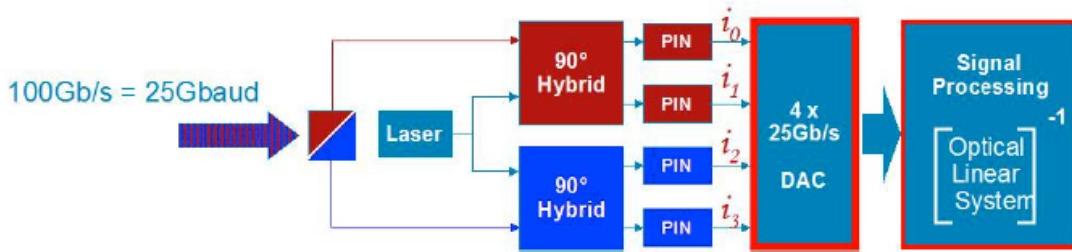
89. On information and belief, the 100G Accused Instrumentalities perform the step of using the controller, controlling a modulator to phase modulate light from a laser as a function of the input data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilized a transceiver where data is converted to drive signals to control

the optical modulators, as shown earlier above. The exemplary ONS 15454 Multiservice Transport Platform has QPSK1 and QPSK2 modulators which phase modulate the laser as a function of the input data from the 100G FEC ASIC, as shown below.



90. On information and belief, the 100G Accused Instrumentalities perform the step of sending the modulated light as an optical signal from the transmitter over an optical fiber. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G transmit phase modulated optical signal over an optical fiber, as shown earlier above.

91. On information and belief, the 100G Accused Instrumentalities perform the step of receiving the optical signals from the optical fiber at a receiver of a further telecommunications box and converting the optical signals to electronic output data. An exemplary fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card is also depicted earlier above at the “Rx in” of the exemplary OIF-CFP2-ACO Standardized module, and at the connection between the RX Coherent Optics block and the CFP2 Connector. On information and belief, the 100G Accused Instrumentalities designed in accordance with the OIF-DPC-RX Standard utilize an integrated receiver module shown as earlier above and below.

**Figure 5.** CP-DQPSK Logical Receiver Scheme

92. On information and belief, the 100G Accused Instrumentalities perform the step of passing the phase-modulated optical signals to a photodetector to produce an electric signal. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G and OIF-DPC-RX Standards utilize a monitoring photodiode (MPD) that taps and receives the phase-modulated incoming optical signal and produces an electrical signal in response, as depicted in earlier above. For example, the ONS 15454 Multiservice Transport Platform passes a phase modulated signal to a PIN photodetector to produce an electrical signal, as shown above.

93. On information and belief, the 100G Accused Instrumentalities perform the step of filtering the electrical signal to produce an average optical power. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard contain an energy level detector (power tap or monitor photodiode (MPD)), as the OIF 100G Standard specifies an integrated receiver module whose functional diagram is shown earlier above. One of the basic requirements for the coherent receiver is an optical power tap (“MPD”) in the signal input path. Table 1 specifies the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values.

94. On information and belief, Defendants have directly infringed and continues to directly infringe the '511 Patent by, among other things, making, using, offering for sale, and/or

selling the 100G Accused Instrumentalities. On information and belief, such products and/or services are covered by one or more claims of the '511 Patent including at least claim 9.

95. By making, using, offering for sale, and/or selling the 100G Accused Instrumentalities infringing the '511 Patent, Defendants have injured Oyster and are liable to Oyster for infringement of the '511 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

96. In addition, Defendants are actively inducing others, such as their customers and end users of 100G Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim 9 of the '511 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendants' customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 9 of the '511 Patent. Defendants have actual knowledge of the '511 Patent at least as of service of this Complaint. Defendants are knowingly inducing its customers and/or end users to directly infringe the '511 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendants' inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '511 Patent.

97. To the extent facts learned in discovery show that Defendants' infringement of the '511 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

98. As a result of Defendants' infringement of the '511 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

99. Unless a permanent injunction is issued enjoining Defendants and their agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '511 Patent, Oyster will be greatly and irreparably harmed.

**COUNT VII**

**INFRINGEMENT OF THE '898 PATENT**

**(against all Defendants)**

100. Oyster references and incorporates by reference paragraphs 1 through 99 of this Complaint.

101. On information and belief, Defendants make, use, offer to sell and/or sell in the United States the 100G Accused Instrumentalities that infringe various claims of the '898 Patent, and continue to do so.

102. On information and belief, the 100G Accused Instrumentalities are a transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. For example, the exemplary ONS 15454 Multiservice Transport Platform includes a transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. The 100G Accused Instrumentalities, on information and belief, are designed in accordance with OIF 100G Standard. OIF has focused on DP-QPSK as the modulation format for 100G. On information

and belief, the 100G Accused Instrumentalities are also designed in accordance with the OIF CFP2 ACO Standard. An exemplary OIF standardized DP-QPSK transceiver for sending and receiving data over optical fibers is shown earlier above. The blocks depicted are implemented on a card.

103. On information and belief, the 100G Accused Instrumentalities comprise a transmitter having a laser, a modulator, and a controller configured to receive input data and control the modulator to generate a first optical signal as a function of the input data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G standard comprise a laser and a modulator. As shown earlier above, OIF 100G Standard devices employ lasers and modulators. As shown earlier above, the Accused Instrumentalities designed in accordance with the OIF CFP2 ACO Standard contain a transmitter (Tx Coherent Optics) with a laser, a modulator, and a driver which is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data. As shown earlier above, an exemplary controller consistent with the OIF CPA2 ACO Standard, and, on information and belief utilized by the 100G Accused Instrumentalities, is configured to receive input data and control the modulator to generate a first optical signal as a function of the input data. The exemplary ONS 15454 Multiservice Transport Platform has QPSK1 and QPSK2 modulators which phase modulate the laser as a function of the input data from the 100G FEC ASIC, as shown earlier above.

104. On information and belief, the 100G Accused Instrumentalities comprise a fiber output optically connected to the transmitter and configured to optically connect the first optical fiber to the transceiver card. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard utilize a laser's optical output as connected through the

“Tx Integrated Photonics” depicted earlier above. Also depicted earlier above is an output to reach the optical transmission fiber. A first optical fiber is also depicted earlier above at the “Tx out” of the exemplary OIF CFP2 ACO Standardized module.

105. On information and belief, the 100G Accused Instrumentalities comprise a receiver configured to receive a second optical signal from the second optical fiber and to convert the second optical signal to output data. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard, including the OIF CPD2 ACO Standard, utilize a receiver module depicted earlier above that receives the optical signal from the receiver fiber at “Signal.” As shown earlier above, the exemplary ONS 15454 Multiservice Transport Platform has a receiver configured to receive a second optical signal from the second optical fiber. The fiber transmits the modulated light signal from the trunk interface to the receiver. The received signal is further processed to electronic output data.

106. On information and belief, the 100G Accused Instrumentalities comprise a fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard connect the laser’s optical output through the “Rx Integrated Photonics”, and also specify an output to reach the optical transmission fiber, as depicted earlier above. An exemplary fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card is also depicted at earlier above at the “Rx in” of the exemplary OIF CFP2 ACO Standardized module, and at the connection between the RX Coherent Optics block and the CFP2 Connector.

107. On information and belief, the 100G Accused Instrumentalities comprise an energy level detector optically connected between the receiver and the fiber input to measure an

energy level of the second optical signal, wherein the energy level detector includes a plurality of thresholds. For example, the 100G Accused Instrumentalities designed in accordance with the OIF 100G Standard and, for example, the OIF DPC RX Standard, contain an energy level detector depicted by the monitoring photodiode (“MPD”). The OIF 100G and OIF DPC RX Standards specify an integrated receiver module whose functional diagram is shown earlier above. One of the basic requirements for the coherent receiver is an optical power tap (monitor photodiode or “MPD”) in the signal input path. This MPD provides a representation of the optical signal strength in the form of an electrical signal. The electrical signal is measured, and provides an indication of the energy level of the optical signal. Table 1 specifies the opto-electrical properties of the receiver. The average optical power of the operating signal has minimum, typical and maximum threshold values.

108. On information and belief, Defendants have directly infringed and continue to directly infringe the ’898 Patent by, among other things, making, using, offering for sale, and/or selling the ’898 Accused Instrumentalities, including the ONS 15454 Multiservice Transport Platform. On information and belief, such products and/or services are covered by one or more claims of the ’898 Patent, including at least claim 1.

109. By making, using, offering for sale, and/or selling the Accused Instrumentalities infringing the ’898 Patent, Defendants have injured Oyster and are liable to Oyster for infringement of the ’898 Patent pursuant to 35 U.S.C. § 271(a) directly and/or under the doctrine of equivalents.

110. In addition, Defendants are actively inducing others, such as their customers and end users of Accused Instrumentalities, services based thereupon, and related products and/or processes, to directly infringe each and every claim limitation, including without limitation claim

1 of the '898 Patent, in violation of 35 U.S.C. § 271(b). Upon information and belief, Defendants' customers and/or end users have directly infringed and are directly infringing each and every claim limitation, including without limitation claim 1 of the '898 Patent. Defendants have actual knowledge of the '898 Patent at least as of service of this Complaint. Defendants are knowingly inducing its customers and/or end users to directly infringe the '898 Patent, with the specific intent to encourage such infringement, and knowing that the induced acts constitute patent infringement. Defendants' inducement includes, for example, providing technical guides, product data sheets, demonstrations, software and hardware specifications, installation guides, and other forms of support that induce its customers and/or end users to directly infringe the '898 Patent.

111. To the extent facts learned in discovery show that Defendants' infringement of the '898 Patent is or has been willful, Oyster reserves the right to request such a finding at time of trial.

112. As a result of Defendants' infringement of the '898 Patent, Oyster has suffered monetary damages in an amount adequate to compensate for Defendants' infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendants, together with interest and costs as fixed by the Court, and Oyster will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

113. Unless a permanent injunction is issued enjoining Defendants and their agents, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '898 Patent, Oyster will be greatly and irreparably harmed.

**PRAAYER FOR RELIEF**

Plaintiff respectfully requests the following relief from this Court:

- A. A judgment that Cisco has infringed one or more claims of the '816, '952, '055, '592, '327, '511, and/or '898 Patents;
- B. A judgment that BT has infringed one or more claims of the '327, '511, and/or '898 Patents;
- C. A permanent injunction enjoining Cisco and its officers, directors, agents, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in active concert or participation with Cisco, from infringing the '816, '952, '055, '592, '327, '511, and/or '898 Patents;
- D. A permanent injunction enjoining BT and its officers, directors, agents, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in active concert or participation with BT, from infringing the '327, '511, and/or '898 Patents;
- E. A judgment and order requiring Defendants to pay Oyster its damages, costs, expenses, and prejudgment and post-judgment interest for Defendants' acts of infringement in accordance with 35 U.S.C. § 284;
- F. A judgment and order requiring Defendants to provide accountings and to pay supplemental damages to Oyster, including, without limitation, prejudgment and post-judgment interest;
- G. A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Oyster its reasonable attorneys' fees against Defendants; and
- H. Any and all other relief to which Oyster may show itself to be entitled.

**JURY TRIAL DEMANDED**

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Oyster requests a trial by jury of any issues so triable by right.

Dated: November 23, 2016

Respectfully submitted,

/s/ Marc A. Fenster

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